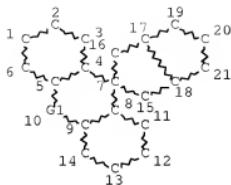


=> d que 137

L3

STR



REP G1=(0-3) CH2

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DEFAULT ECLEVEL IS LIMITED

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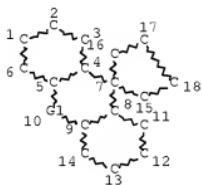
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NUMBER OF NODES IS 21

STEREO ATTRIBUTES: NONE

L5

STR



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NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

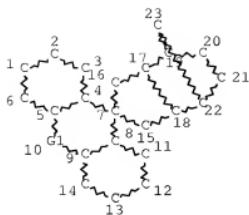
RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 18

STEREO ATTRIBUTES: NONE

L9

STR

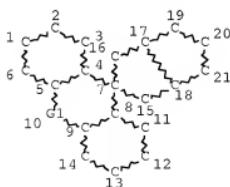


REP G1=(0-3) CH2  
 NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 23

STEREO ATTRIBUTES: NONE  
 L11        3148 SEA FILE=REGISTRY SSS FUL L5  
 L14        15 SEA FILE=REGISTRY SUB=L11 SSS FUL L9  
 L15        14 SEA FILE=HCAPLUS ABB=ON PLU=ON L14  
 L24        54 SEA FILE=REGISTRY SUB=L11 SSS FUL L3  
 L26        46 SEA FILE=REGISTRY ABB=ON PLU=ON L24 NOT FULLER?  
 L27        35 SEA FILE=REGISTRY ABB=ON PLU=ON L26 NOT FLUORANTHENE?  
 L28        34 SEA FILE=REGISTRY ABB=ON PLU=ON L27 NOT 1-100/SI  
 L29        30 SEA FILE=REGISTRY ABB=ON PLU=ON L28 NOT DISPIRO?  
 L32        29 SEA FILE=REGISTRY ABB=ON PLU=ON L29 NOT MORPHOLINYL?  
 L33        28 SEA FILE=REGISTRY ABB=ON PLU=ON L32 NOT MORPHOLINE?  
 L34        15 SEA FILE=REGISTRY ABB=ON PLU=ON L33 AND L14  
 L36        14 SEA FILE=HCAPLUS ABB=ON PLU=ON L34  
 L37        14 SEA FILE=HCAPLUS ABB=ON PLU=ON L15 OR L36

=> d que 138  
 L3            STR



REP G1=(0-3) CH2  
 NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM

10/556,717

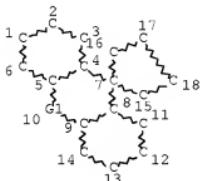
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 21

STEREO ATTRIBUTES: NONE

L5 STR



REP G1=(0-3) CH2

NODE ATTRIBUTES:

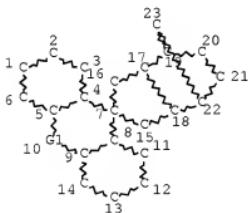
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 18

STEREO ATTRIBUTES: NONE

L9 STR



REP G1=(0-3) CH2

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 23

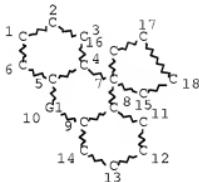
STEREO ATTRIBUTES: NONE

L11 3148 SEA FILE=REGISTRY SSS FUL L5

10/556,717

L14        15 SEA FILE=REGISTRY SUB=L11 SSS FUL L9  
L15        14 SEA FILE=HCAPLUS ABB=ON PLU=ON L14  
L20        2 SEA FILE=MARPAT SSS FUL L9  
L24        54 SEA FILE=REGISTRY SUB=L11 SSS FUL L3  
L26        46 SEA FILE=REGISTRY ABB=ON PLU=ON L24 NOT FULLER?  
L27        35 SEA FILE=REGISTRY ABB=ON PLU=ON L26 NOT FLUORANTHENE?  
L28        34 SEA FILE=REGISTRY ABB=ON PLU=ON L27 NOT 1-100/SI  
L29        30 SEA FILE=REGISTRY ABB=ON PLU=ON L28 NOT DISPIRO?  
L32        29 SEA FILE=REGISTRY ABB=ON PLU=ON L29 NOT MORPHOLINYL?  
L33        28 SEA FILE=REGISTRY ABB=ON PLU=ON L32 NOT MORPHOLINE?  
L34        15 SEA FILE=REGISTRY ABB=ON PLU=ON L33 AND L14  
L36        14 SEA FILE=HCAPLUS ABB=ON PLU=ON L34  
L37        14 SEA FILE=HCAPLUS ABB=ON PLU=ON L15 OR L36  
L38        0 SEA FILE=MARPAT ABB=ON PLU=ON L20 NOT L37

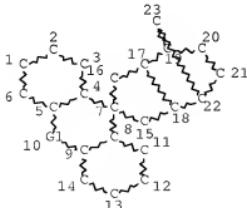
=> d que 116  
L5              STR



REP G1=(0-3) CH2  
NODE ATTRIBUTES:  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 18

STEREO ATTRIBUTES: NONE  
L9              STR



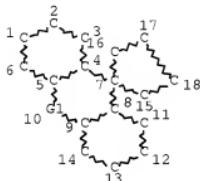
REP G1=(0-3) CH2

NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 23

STEREO ATTRIBUTES: NONE  
 L11 3148 SEA FILE=REGISTRY SSS FUL L5  
 L14 15 SEA FILE=REGISTRY SUB=L11 SSS FUL L9  
 L16 0 SEA FILE=CAOLD ABB=ON PLU=ON L14

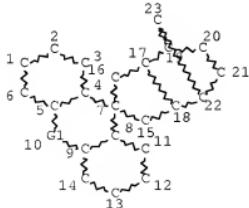
=> d que l18  
 L5 STR



REP G1=(0-3) CH2  
 NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 18

STEREO ATTRIBUTES: NONE  
 L9 STR



REP G1=(0-3) CH2  
 NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM

10/556,717

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 23

STEREO ATTRIBUTES: NONE

L11 3148 SEA FILE=REGISTRY SSS FUL L5

L14 15 SEA FILE=REGISTRY SUB=L11 SSS FUL L9

L18 0 SEA FILE=BEILSTEIN ABB=ON PLU=ON L14

=> d 137 1-14 ibib ed abs hitstr hitind  
 YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS' - CONTINUE? (Y)/N:y

L37 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2008:583235 HCAPLUS Full-text  
 DOCUMENT NUMBER: 148:540349  
 TITLE: Purification of cycloolefin compounds  
 INVENTOR(S): Kaizu, Michitaka; Masutani, Masataka; Oda,  
 Hirokazu; Nishimura, Toshiro  
 PATENT ASSIGNEE(S): Jsr Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 14pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008110930	A	20080515	JP 2006-294259	20061030
PRIORITY APPLN. INFO.:			JP 2006-294259	20061030

ED Entered STN: 15 May 2008

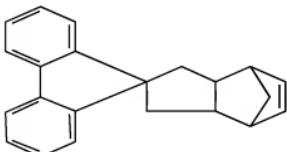
AB Cycloolefin compds. are purified by (1) contacting organic solvent A solution of cycloolefin compds. with aqueous medium to remove water-soluble components from A to the aqueous medium, (2) removing at least a part of A, and (3) adding a mixture of A and poor solvent B for the cycloolefin compds. to the concentrated solution for precipitation of the products. Thus, a reaction product containing spiro[fluorene-9,8'-tricyclo[4.3.0.12.5][3]decene] (I) was washed with H2O and the toluene layer was concentrated to half and added dropwise to a mixture of toluene and MeOH. The mixture was further stirred at 0° for 1 h to give 67.2% I with purity 99.24%.

IT 908004-25-1P

(purification of cycloolefin compds. by removing water-soluble components from organic solvent solution upon washing with aqueous medium, concentration, and precipitation with poor solvent)

RN 908004-25-1 HCAPLUS

CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro- (CA INDEX NAME)



CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
 IT 908004-25-1P

(purification of cycloolefin compds. by removing water-soluble components from organic solvent solution upon washing with aqueous medium, concentration, and precipitation with poor solvent)

L37 ANSWER 2 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2008:468745 HCPLUS Full-text  
 DOCUMENT NUMBER: 148:450087  
 TITLE: Manufacture of spiro hydrocarbons with low cost of organic solvents  
 INVENTOR(S): Kaizu, Michitaka; Masutani, Masataka; Nishimura, Toshiro  
 PATENT ASSIGNEE(S): JSR Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 20pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008088091	A	20080417	JP 2006-269717	20060929
PRIORITY APPLN. INFO.:			JP 2006-269717	20060929

ED Entered STN: 17 Apr 2008  
 GI

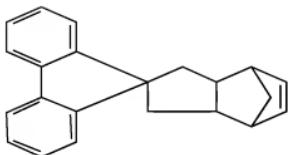
\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB Spiro hydrocarbons I [R1-R8 = H, polar group, C1-30 hydrocarbyl which may have C1-10 hydrocarbylene or linking group containing O, N, S, or Si; R10, R11 = H, polar group, C1-30 hydrocarbyl including (un)substituted unsatd. structure which may have linking group containing O, N, S, or Si; R12-R17 = H, C1-10 hydrocarbylene; A = single bond, O, S, SO, SO<sub>2</sub>, CO, (CH<sub>2</sub>)<sub>n</sub>, NR18, Si(R19)<sub>2</sub>; R18, R19 = C1-30 hydrocarbyl which may have halogen atom; a-c, n = 0-2] or II (R1-R15, A, a-c = same as above), useful for polymeric optical materials, are manufactured by feeding cyclic hydrocarbons III (R1-R8, A, a-c = same as above) and alkali metal hydroxides into organic solvents having b.p. 100-200°, and mixing with soins. comprising the organic solvents and XCR12R13CR10R16CR11R17CR14R15Y [IV; R10-R17 = same as above; X, Y = halo, R20S03, (R21O)R22P(O)O; R21, R22 = (halo-substituted) C1-30 hydrocarbyl] or XCR12R13CR10:CR11CR14R15Y (V; R10-R15, X, Y = same as above) under reflux conditions. Preferably, ≥30% of the organic solvents are recovered from reaction mixts. by distillation, and recycled to manufacture of IV or V, or to manufacture of I or II. Thus, a solution comprising PhMe 446, fluorene 65.3, KOH 97.9 kg was heated, gradually mixed with a solution comprising 549 kg PhMe and 182 kg 5,6-di(p-toluenesulfonyloxyethyl)bicyclo[2.2.1]hept-2-ene (VI) under reflux condition, and washed with water 4 times to give a PhMe phase containing spiro(fluorene-9,8'-tricyclo[4.3.0.12.5][3]decene) in 76.2% yield. Then, 500 kg PhMe was recovered from the PhMe phase. VI was manufactured by using the recovered PhMe PhMe in a yield comparable to that in manufacture by using virgin PhMe.

IT 908004-25-1P

(manufacture of spiro hydrocarbons by cyclization of hydrocarbons with

active methylene compds. and in-process recycling of organic solvents)  
 RN 908004-25-1 HCPLUS  
 CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro- (CA INDEX NAME)



CC 35-2 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 25, 73

IT 908004-25-1P  
 (manufacture of spiro hydrocarbons by cyclization of hydrocarbons with active methylene compds. and in-process recycling of organic solvents)

L37 ANSWER 3 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:416735 HCPLUS Full-text

DOCUMENT NUMBER: 148:404056

TITLE: Norbornene-based polymers with negative retardation in the thickness direction and films useful for polarizing plate and liquid crystal display device made from the polymers

INVENTOR(S): Nozoe, Yutaka; Watanabe, Saisuke

PATENT ASSIGNEE(S): Fujifilm Corporation, Japan

SOURCE: U.S. Pat. Appl. Publ., 18pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

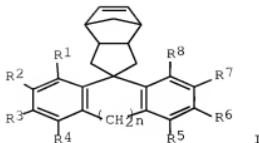
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20080081890	A1	20080403	US 2007-862322	20070927
US 7390864	B2	20080624		
JP 2008081655	A	20080410	JP 2006-265002	20060928
KR 2008029834	A	20080403	KR 2007-97241	20070927
PRIORITY APPLN. INFO.:			JP 2006-265002	A 20060928

ED Entered STN: 03 Apr 2008

GI



**AB** The polymers are formed by addition polymerization of a composition comprising at least one norbornene derivative represented by I (R1, R2, R3, R4, R5, R6, R7, R8 = H or a substituent; n = 0 to 2). Thus, heating dicyclopentadiene with allyl acetate in the presence of small amount of hydroquinone at 180° for 9 h gave a product which was polymerized to give a polymer having the claimed properties.

**IT** 1015787-82-2P 1015787-83-3P 1015787-85-5P

(norbornene-based polymers with neg. retardation in thickness direction and films useful for polarizing plate and liquid crystal display device made from the polymers)

**RN** 1015787-82-2 HCPLUS

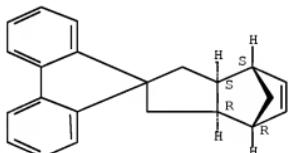
**CN** Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'R,7'S,7'aS)-rel-, homopolymer (CA INDEX NAME)

**CM** 1

**CRN** 791813-27-9

**CMF** C22 H20

Relative stereochemistry.



**RN** 1015787-83-3 HCPLUS

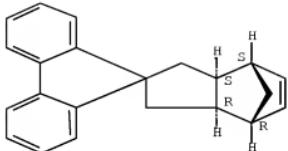
**CN** Bicyclo[2.2.1]hept-5-ene-2-methanol, 2-acetate, polymer with rel-(3'aR,4'R,7'S,7'aS)-1',3',3'a,4',7',7'a-hexahydrospiro[9H-fluorene-9,2'-(4,7)methano[2H]indene] (CA INDEX NAME)

**CM** 1

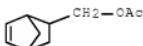
**CRN** 791813-27-9

**CMF** C22 H20

Relative stereochemistry.



CM 2

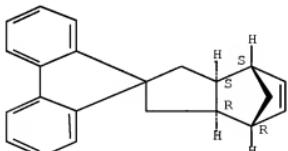
CRN 10471-24-6  
CMF C10 H14 O2

RN 1015787-85-5 HCPLUS  
 CN Pentanoic acid, bicyclo[2.2.1]hept-5-en-2-ylmethyl ester, polymer with  
 rel-(3'aR,4'R,7'S,7'as)-1',3',3'a,4',7',7'a-hexahydrospiro[9H-fluorene-  
 9,2'-(4,7)methano[2H]indene] (CA INDEX NAME)

CM 1

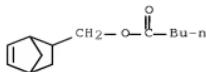
CRN 791813-27-9  
CMF C22 H20

Relative stereochemistry.



CM 2

CRN 118361-19-6  
CMF C13 H20 O2



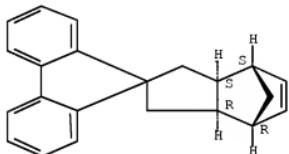
IT 791813-27-9P

(norbornene-based polymers with neg. retardation in thickness direction and films useful for polarizing plate and liquid crystal display device made from the polymers)

RN 791813-27-9 HCPLUS

CN Spiro[9H-fluorene-9,2'-(4,7]methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'R,7'S,7'aS)-rel- (CA INDEX NAME)

Relative stereochemistry.



INCL -526

CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 38, 74

IT 26935-85-3P 1015787-82-2P 1015787-83-3P

1015787-85-5P

(norbornene-based polymers with neg. retardation in thickness direction and films useful for polarizing plate and liquid crystal display device made from the polymers)

IT 6143-29-9P 70096-09-2P 118361-19-6P 791813-27-9P

(norbornene-based polymers with neg. retardation in thickness direction and films useful for polarizing plate and liquid crystal display device made from the polymers)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L37 ANSWER 4 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:278915 HCPLUS Full-text

DOCUMENT NUMBER: 148:309101

TITLE: Cycloolefin copolymers with uniform distribution of structural units, and their manufacture method and uses as optical materials

INVENTOR(S): Yoshida, Shuichi; Mutsga, Yasuaki; Kawashima, Naoyuki; Miyaki, Nobuyuki; Kajiwara, Ichiro

PATENT ASSIGNEE(S): Jsr Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 29pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008050495	A	20080306	JP 2006-229592	20060825
PRIORITY APPLN. INFO.:			JP 2006-229592	20060825

ED Entered STN: 06 Mar 2008

AB Title method involves copolymer of (A) cycloolefins having norbornene skeletons and aromatic ring structures with (B) cycloolefins having norbornene skeletons and no aromatic ring structures, wherein the polymerization is started using 5-90% of total monomers and polymerization catalysts and the residual monomers are added to the system during the polymerization. The copolymers with good transparency, heat resistance, solubility in organic solvents, strength, and processability, show (maldistribution of the aromatic ring structures) = |(R100000)/(U100000) - (R1000)/(U1000)| ≤ 1 (R100000 and R1000 are intensities at mol. weight 10,000 and 1000 in differential mol. weight distribution curves obtained from refractive index measurements, resp.; U100000 and U1000 are intensities at mol. weight 100,000 and 1000 in differential mol. weight distribution curves obtained from UV absorption measurements at 254 nm, resp.). The uses include optical parts, (stretched) optical films showing peculiar birefringence and wavelength dependence, polarizing plates with the stretched films, and liquid crystal displays equipped with the polarizing plates. Thus, copolymer, spiro[fluorene-9,8'-tricyclo[4.3.0.12,5][3]decene] 22, 8-methoxycarbonyl-8-methyltetracyclo[4.4.0.12,5.17,10]-3-dodecene (I) 59, and bicyclo[2.2.1]hept-2-ene 4 g in the presence of Et3Al and WCl6, dropwise adding 15 g I after temperature increase rate of the polymerization solution reached 1°/min, further polymerizing, and hydrogenating gave a hydrogenated copolymer (maldistribution of the aromatic ring structures 0.74, logarithmic viscosity 0.72, Tg 165°), which was cast on a glass container, released from the glass surfaces, and uniaxially stretched to give a stretched film showing maximum stress 64 kg/cm2 at 2-fold stretching, haze 0.4, retardation 210, 235, and 244 nm at 450, 550, and 650 nm, resp. A liquid crystal TV with the stretched film showed good contrast.

IT 1009643-07-5DB, hydrogenated  
(cycloolefin copolymers with suppressed uniform distribution of structural units and their optical films for polarizing plates of liquid crystal displays)

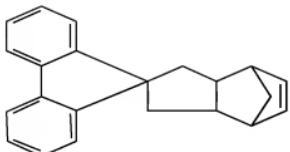
RN 1009643-07-5 HCPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-2-methyl-, methyl ester, polymer with 1',3',3'a,4',7',7'a-hexahydrospiro[9H-fluorene-9,2'-(4,7)methano[2H]indene] and bicyclo[2.2.1]hept-2-ene (CA INDEX NAME)

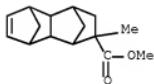
CM 1

CRN 908004-25-1

CMF C22 H2O



CM 2

CRN 58732-15-3  
CMF C15 H20 O2

CM 3

CRN 498-66-8  
CMF C7 H10

CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 38, 73, 74

IT 1009643-07-SDP, hydrogenated

(cycloolefin copolymers with suppressed uniform distribution of structural units and their optical films for polarizing plates of liquid crystal displays)

L37 ANSWER 5 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:249623 HCPLUS Full-text

DOCUMENT NUMBER: 148:286392

TITLE: Cyclic olefin addition copolymers, their manufacture, and their optical members and films

INVENTOR(S): Sakagami, Toshinori; Hirano, Akira; Maruyama, Yoichiro

PATENT ASSIGNEE(S): Jsr Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 43pp.

DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008045069	A	20080228	JP 2006-223512	20060818
PRIORITY APPLN. INFO.:			JP 2006-223512	20060818

ED Entered STN: 28 Feb 2008  
 GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

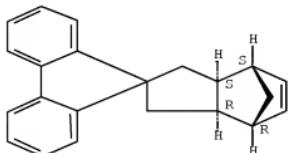
AB The copolymers are manufactured by addition copolyrn. of I (A1-A4 = H, halo, C1-20 alkyl, aryl, cycloalkyl, halogenated hydrocarbon, hydrolyzable silyl group, (CH<sub>2</sub>)<sub>q</sub>X; A1 and A2 or A3 and A4 may link together to form an alkylidene group; A1 and A2, A3 and A4 or A2 and A3 may link together to form C or heterocyclic rings; p = 0, 1; q = 0-5; X = CO<sub>2</sub>A<sub>5</sub>, OCOA<sub>6</sub>, OA<sub>7</sub>; A<sub>5</sub>, A<sub>6</sub>, A<sub>7</sub> = C1-10 hydrocarbon group, halogenated hydrocarbon, oxetanyl-containing substituent) and II [m, n = 0-2; B1-B8 = H, halo, (linkage group-containing) C1-30 hydrocarbon group, polar group; s, t, u = 0-3] in the presence of polymerization catalysts (A) Pd organic acid salts or  $\beta$ -diketonate compds., (B) phosphine compds. PR<sub>1</sub>R<sub>2</sub> (R<sub>1</sub> = cyclopentyl, cyclohexyl, isopropyl; R<sub>2</sub> = C3-10 hydrocarbon group), and (D) ionic B compds., or (C) divalent Pd phosphine complexes Pd(PR<sub>1</sub>R<sub>2</sub>)<sub>n</sub>X<sub>2</sub> (R<sub>1</sub>, R<sub>2</sub> = same as above; X = organic acid anion or  $\beta$ -diketonate anion; n = 1, 2), and D. Thus, polymerization of 5-butylbicyclo[2.2.1]hepta-2-ene, 5-decylbicyclo[2.2.1]hepta-2-ene, and spiro[fluorene-9,8'-tricyclo[4.3.0.12.5][3]decene] in the presence of (tricyclopentylphosphine)palladium diacetate and triphenylcarbenium tetrakis(pentafluorophenyl) borate gave a copolymer, which was mixed with additives and vacuum-pressed to give a film with Tg 232° and low retardation and water absorption.

IT 791813-27-9P, exo-Spiro[fluorene-9,8'-tricyclo[4.3.0.12.5][3]decene]  
 (manufacture of cyclic olefin addition copolymers for optical films with low retardation)

RN 791813-27-9 HCAPLUS

CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indenel, 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'R,7'S,7'aS)-rel- (CA INDEX NAME)

Relative stereochemistry.



IT 1008099-38-6P, 5-Butylbicyclo[2.2.1]hepta-2-ene-5-decylbicyclo[2.2.1]hepta-2-ene-exo-spiro[fluorene-9,8'-tricyclo[4.3.0.12.5][3]decene] copolymer 1008100-00-2P,  
Bicyclo[2.2.1]hepta-2-ene-5-butylbicyclo[2.2.1]hepta-2-ene-exo-spiro[fluorene-9,8'-tricyclo[4.3.0.12.5][3]decene] copolymer  
(manufacture of cyclic olefin addition copolymers for optical films with low retardation)

RN 1008099-98-6 HCPLUS

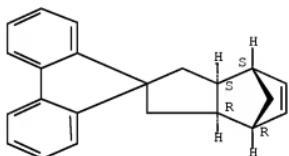
CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'R,7'S,7'aS)-rel-, polymer with 5-butylbicyclo[2.2.1]hept-2-ene and 5-decylbicyclo[2.2.1]hept-2-ene (CA INDEX NAME)

CM 1

CRN 791813-27-9

CMF C22 H20

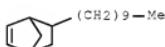
Relative stereochemistry.



CM 2

CRN 22094-85-5

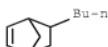
CMF C17 H30



CM 3

CRN 22094-81-1

CMF C11 H18



RN 1008100-00-2 HCAPLUS

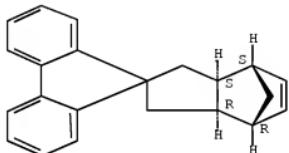
CN Spiro[9H-fluorene-9,2'-(4,7]methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'R,7'S,7'aS)-rel-, polymer with bicyclo[2.2.1]hept-2-ene and 5-butylbicyclo[2.2.1]hept-2-ene (CA INDEX NAME)

CM 1

CRN 791813-27-9

CMF C22 H20

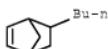
Relative stereochemistry.



CM 2

CRN 22094-81-1

CMF C11 H18



CM 3

CRN 498-66-8

CMF C7 H10



CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 25, 35, 73

IT 791813-27-9P, exo-Spiro[fluorene-9,8'-

## tricyclo[4.3.0.12.5][3]decene]

(manufacture of cyclic olefin addition copolymers for optical films with low retardation)

IT 1008099-98-6P, 5-Butylbicyclo[2.2.1]hepta-2-ene-5-decylbicyclo[2.2.1]hepta-2-ene-exo-spiro[fluorene-9,8'-tricyclo[4.3.0.12.5][3]decene] copolymer 1008180-06-2P, Bicyclo[2.2.1]hepta-2-ene-5-butylbicyclo[2.2.1]hepta-2-ene-exo-spiro[fluorene-9,8'-tricyclo[4.3.0.12.5][3]decene] copolymer  
(manufacture of cyclic olefin addition copolymers for optical films with low retardation)

L37 ANSWER 6 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:1237371 HCPLUS Full-text

DOCUMENT NUMBER: 147:502739

TITLE: Preparation of polycyclic hydrocarbon compounds

INVENTOR(S): Hirano, Akira; Katsuta, Kohei; Miyaki, Nobuyuki; Ebata, Satoshi

PATENT ASSIGNEE(S): Jsr Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 25pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

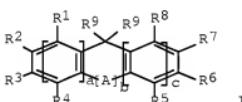
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007284401	A	20071101	JP 2006-115582	20060419
PRIORITY APPLN. INFO.:			JP 2006-115582	20060419

OTHER SOURCE(S): MARPAT 147:502739

ED Entered STN: 01 Nov 2007

GI



AB Title compds. (I) [R1-R8 = H, halo, (un)substituted C1-30 hydrocarbyl optionally having C1-10 divalent linking group or linking group containing O, N, S, or Si, polar group; R9 = H, halo, C1-30 hydrocarbyl optionally having linking group containing O, N, S, or Si, polar group; 2 R9 groups may be bonded together to form CH2CHR10CHR11CH2, CH2CR10:CR11CH2; R10, R11 = any group given for R9; R10 and R11 may be bonded together to form (hetero)cyclic ring; a, b, c = 0-2; A = direct bond, O, S, SO, SO2, CO, NR18, SiR192 [R18, R19 = C1-30 (halo)hydrocarbyl], (CH2)<sup>m</sup> (n = 0-2)], useful as monomers or monomer precursors for cycloolefin polymers, are prepared by reacting I (R1-R9, A, a, b, c = same as above; R9X [R9 = same as above; X = halo, OSO2R20 [R20 = C1-30 (halo)hydrocarbyl], OP(O)R22(OR21) [R21, R22 = C1-30 (halo)hydrocarbyl]], XCH2CHR10CHR11CH2Y [R10, R11 = same as above; X, Y = any group given for X; X and Y may be bonded together to form OP(O)R22O], or

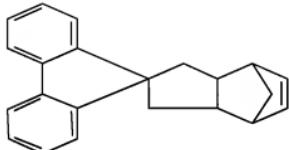
XCH2CR10:CR11CH2Y in hydrocarbon solvents in the presence of alkali metal hydroxides. Thus, KOH was gradually added to toluene solution of 5,6-di(p-toluenesulfonyloxyethyl)bicyclo[2.2.1]hept-2-ene and fluorene under reflux. Yield of spiro[fluorene-9,8'-tricyclo[4.3.0.12,5]3]decene 5 h after addition of KOH was 58%.

IT 903004-25-1P

(preparation of (spiro structure-containing) polycyclic hydrocarbon compds. as monomers (precursors) for cycloolefin polymers)

RN 908004-25-1 HCPLUS

CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro- (CA INDEX NAME)



CC 35-2 (Chemistry of Synthetic High Polymers)

IT 903004-25-1P

(preparation of (spiro structure-containing) polycyclic hydrocarbon compds. as monomers (precursors) for cycloolefin polymers)

L37 ANSWER 7 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:760479 HCPLUS Full-text

DOCUMENT NUMBER: 147:167069

TITLE: Ring-opening polymerization polymer of cycloolefin, optical parts and films therefrom  
INVENTOR(S): Kawashima, Naoyuki; Miyaki, Nobuyuki; Miyamoto, Yoshikazu; Kajiwara, Ichiro

PATENT ASSIGNEE(S): JSR Corporation, Japan  
SOURCE: PCT Int. Appl., 58pp.

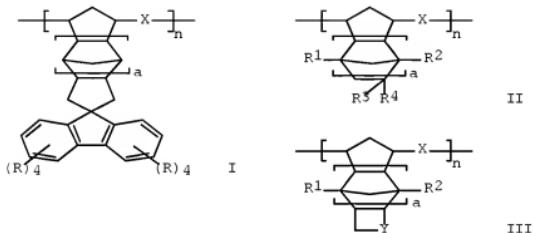
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007077771	A1	20070712	WO 2006-JP325661	20061222
W: AB, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,				

ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
JP 2007204731 A 20070816 JP 2006-254919 20060920  
PRIORITY APPLN. INFO.: JP 2006-1344 A 20060106  
JP 2006-254919 A 20060920

ED      Entered STN:  13 Jul 2007  
GI



AB The polymer, being good in transparency, heat resistance, solubility in organic solvents, strength, and processability, comprises ≥2 kinds of structural units selected from structural units represented by formula I, II, and III, wherein a = 0 or 1; R, R<sub>1</sub>-R<sub>4</sub> = H, halogen, C1-30 hydrocarbon group containing O, S, N, or Si, and polar group; X, Y = -CH=CH-, or -CH<sub>2</sub>CH<sub>2</sub>-.

Thus, 100 g 5-norbornene-2,3-dicarboxylic anhydride was reduced by 39.0 g lithium aluminum hydride in THF to give 83 g 5,6-bis(hydroxymethyl)bicyclo[2.2.1]hept-2-ene, 36 g of which was reacted with 99 g p-toluenesulfonyl chloride to give 66 g 5,6-di(4-toluenesulfonyloxy)methylbicyclo[2.2.1]hept-2-ene (A). 36 G Fluorene was added with 270 mL 1.6 M Bu lithium in hexane at -50°, added with 50 g A at -50°, stirred at room temperature for 15 h to give 11 g spiro[fluorene-9, 8'-tricyclo[4.3.0.12.5][3]decenyl], 30 g of which was polymerized with 66 g Me 4-methyltetracyclo[6.2.1.13,6.02,7]dodec-9-ene-4-carboxylate and 4 g 2-norbornylene in the presence of triethylaluminum and methanol-modified WC16 at 80° for 1 h to give a polymer, which was hydrogenated in the presence of a catalyst RuHCl(CO)<sub>3</sub>P(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub> at 160-165° to give a title polymer.

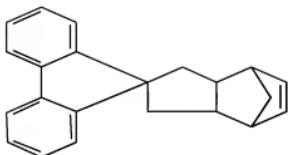
IT 943791-16-0DPB, hydrogenated  
(ring-opening polymerization polymer of cycloolefin, optical parts and

films therefrom)

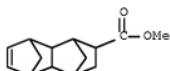
RN 943791-16-0 HCPLUS  
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-, methyl ester, polymer with bicyclo[2.2.1]hept-2-ene and 1',3',3'a,4',7',7'a-hexahydrospiro[9H-fluorene-9,2'-(4,7-methano[2]indenyl] (CA INDEX NAME)

CM 1

CRN 908004-25-1  
CME C22 H20



CM 2

CRN 41596-02-5  
CMF C14 H18 O2

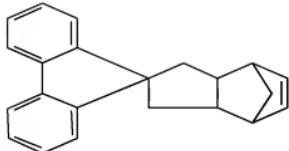
CM 3

CRN 498-66-8  
CMF C7 H10

IT 908004-25-12  
 (ring-opening polymerization polymer of cycloolefin, optical parts and  
 films therefrom)

RN 908004-25-1 HCPLUS

CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-  
 hexahydro- (CA INDEX NAME)



CC 37-3 (Plastics Manufacture and Processing)  
 Section cross-reference(s): 38, 73  
 IT 943791-16-0DP, hydrogenated  
     (ring-opening polymerization polymer of cycloolefin, optical parts and  
     films therefrom)  
 IT 85-39-2P, 5,6-Bis(hydroxymethyl)bicyclo[2.2.1]hept-2-ene  
 95442-44-7P, 5,6-Di(4-toluenesulfonyloxyethyl)bicyclo[2.2.1]hept-2-  
 ene 908004-25-1P  
     (ring-opening polymerization polymer of cycloolefin, optical parts and  
     films therefrom)  
 REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE  
 RE FORMAT

L37 ANSWER 8 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2007:435619 HCPLUS Full-text  
 DOCUMENT NUMBER: 1461:431510  
 TITLE: Process for producing phase difference film, phase  
       difference film, and use thereof  
 INVENTOR(S): Mitsubishi, Tomohiro; Sekiguchi, Masayuki; Ushino,  
       Takahiro  
 PATENT ASSIGNEE(S): JSR Corporation, Japan  
 SOURCE: PCT Int. Appl., 72pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007043573	A1	20070419	WO 2006-JP320306	20061011
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
JP 2007108529	A	20070426	JP 2005-300710	20051014
KR 2008059644	A	20080630	KR 2008-711395	20080513
PRIORITY APPLN. INFO.:			JP 2005-300710	A 20051014

ED Entered STN: 20 Apr 2007

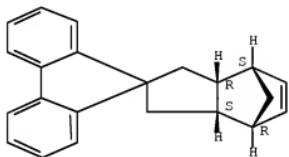
AB The process comprises stretching a norbornene resin film in a film roll widthwise direction by a factor of 1.5-5 and shrinking the film in the longitudinal direction to produce a phase difference film of which the optical axis is in the widthwise direction of the film roll. The phase difference film has excellent transparency, dimensional stability, and view angle properties, has low gas permeability, has an optical axis in the cross direction, and has no significant variation in in-plane phase difference. There is also provided a process for producing a polarizing plate that can produce a high-performance polarizing plate in a simple manner with high production efficiency.

IT 791813-28-0P  
(preparation of norbornene derivs. for transparent phase difference films)

RN 791813-28-0 HCPLUS

CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'S,7'R,7'aS)-rel- (CA INDEX NAME)

Relative stereochemistry.



IT 934389-76-1UP, hydrogenated

(transparent phase difference films for polarizing plates and liquid crystal displays)

RN 934389-76-1 HCPLUS

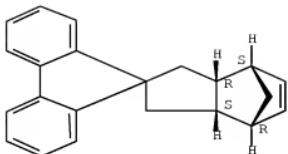
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-2-methyl-, methyl ester, polymer with rel-(3'aR,4'S,7'R,7'aS)-1',3',3'a,4',7',7'a-hexahydrospirop[9H-fluorene-9,2'-(4,7)methano[2H]indene] and 1,2,3,4,4a,5,8,8a-octahydro-1,4:5,8-dimethanonaphthalene-2-carboxylic acid (CA INDEX NAME)

CM 1

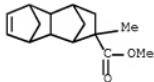
CRN 791813-28-0

CMF C22 H20

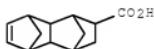
Relative stereochemistry.



CM 2

CRN 58732-15-3  
CMF C15 H20 O2

CM 3

CRN 46382-54-1  
CMF C13 H16 O2

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 38  
 IT 33493-88-8P 791813-28-0P  
     (preparation of norbornene derivs. for transparent phase difference films)  
 IT 123303-71-9DP, hydrogenated 216987-03-0DP, hydrogenated  
 934389-76-1EP, hydrogenated  
     (transparent phase difference films for polarizing plates and liquid crystal displays)  
 REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L37 ANSWER 9 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2006:1250985 HCPLUS Full-text  
 DOCUMENT NUMBER: 146:28355

TITLE: Metal hydride complexes for use in hydrogenation of ring-opening polymerization polymer of cycloolefins with freedom from gel complication

INVENTOR(S): Katsuda, Kohei; Fukuhara, Seiji; Maruyama, Yoichiro; Okaniwa, Motoki; Shibata, Hiraku; Suwa, Yoshimi; Kajiwara, Ichiro

PATENT ASSIGNEE(S): JSR Corporation, Japan

SOURCE: PCT Int. Appl., 87pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006126612	A1	20061130	WO 2006-JP310398	20060524
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
JP 2007001967	A	20070111	JP 2005-276253	20050922
JP 2007106932	A	20070426	JP 2005-300459	20051014
EP 1884519	A1	20080206	EP 2006-746827	20060524
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR				
CN 101180303	A	20080514	CN 2006-80017733	20071122
KR 2008015026	A	20080215	KR 2007-730082	20071224
PRIORITY APPLN. INFO.:			JP 2005-152163	A 20050525
			JP 2005-276253	A 20050922
			JP 2005-300459	A 20051014
			WO 2006-JP310398	W 20060524

OTHER SOURCE(S): MARPAT 146:28355

ED Entered STN: 30 Nov 2006

AB A metal hydride complex which is a hydride complex of a metal selected from the group consisting of ruthenium, rhodium, osmium, and iridium and has one or more aromatic carboxylic acid residues is provided. It is a novel metal hydride complex which dissolves in a high concentration in organic solvents having low polarity, such as hydrocarbon solvents, and which has high catalytic activity in the hydrogenation of carbon-carbon double bonds. The metal hydride complex is suitable for use as a catalyst especially in the hydrogenation of a ring-opening polymerization polymer of a cycloolefin.

IT 915969-19-6DP, hydrogenated

(manufacture of metal hydride complexes useful as catalysts for hydrogenation of ring-opening polymerization polymers of cycloolefins with freedom from gel complication)

RN 915969-19-6 HCPLUS

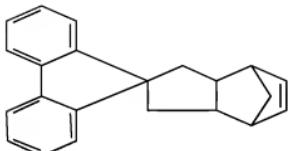
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-

octahydro-2-methyl-, methyl ester, polymer with 1',3',3'a,4',7',7'a-hexahydrospiro[9H-fluorene-9,2'-(4,7]methano[2H]indene] (CA INDEX NAME)

CM 1

CRN 908004-25-1

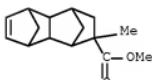
CMF C22 H20



CM 2

CRN 58732-15-3

CMF C15 H20 O2



CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 67, 78

IT 123303-71-9DP, hydrogenated 133126-13-3DP, hydrogenated  
666860-23-7DP, hydrogenated 915969-19-6DP, hydrogenated  
(manufacture of metal hydride complexes useful as catalysts for  
hydrogenation of ring-opening polymerization polymers of cycloolefins with  
freedom from gel complication)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN THE  
RE FORMAT

L37 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:1030832 HCAPLUS Full-text

DOCUMENT NUMBER: 145:397250

TITLE: Process for the preparation of spiro compound  
INVENTOR(S): Kawashima, Naoyuki; Miyaki, Nobuyuki; Miyamoto,  
Yoshikazu; Kajiwara, Ichiro

PATENT ASSIGNEE(S): Jsr Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 22pp.

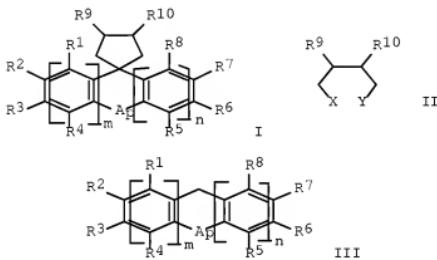
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE : Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006265176	A	20061005	JP 2005-85961	20050324
PRIORITY APPLN. INFO.:			JP 2005-85961	20050324

OTHER SOURCE(S) : CASREACT 145:397250; MARPAT 145:397250  
 ED Entered STN: 05 Oct 2006  
 GI



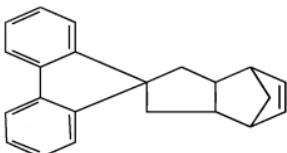
AB A process for the preparation of title compds. of formula I [R1-R8 = H or halo; R9R10 = (hetero)cyclyl; A = a single bond or divalent; m, n, p = 0-2] comprising cyclocondensation reaction of a compound of formula II (X, Y = halo or phosphate ester) with a compound of formula III [R1-R8 and A are defined as above] in the presence of metal hydride as bases is disclosed. The manufacturing method which can obtain the spiro compound cheaply and efficiently is provided.

IT 908004-25-1P

(preparation of spiro compound by cyclocondensation of fluorene with 5,6-di(p-toluenesulfonyloxy)methyl)bicyclo[2.2.1]hept-2-ene)

RN 908004-25-1 HCPLUS

CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro- (CA INDEX NAME)



CC 25-27 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)  
 IT 908004-25-1P

(preparation of spiro compound by cyclocondensation of fluorene with  
 5,6-di(p-toluenesulfonyloxymethyl)bicyclo[2.2.1]hept-2-ene)

L37 ANSWER 11 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:886278 HCPLUS Full-text

DOCUMENT NUMBER: 145:293498

TITLE: Preparation of norbornene derivatives by  
 Diels-Alder reaction of cycloolefins and  
 cyclopentadienes

INVENTOR(S): Kawashima, Naoyuki; Miyaki, Nobuyuki; Miyamoto,  
 Yoshikazu; Kajiwara, Ichiro

PATENT ASSIGNEE(S): JSR Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 19pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

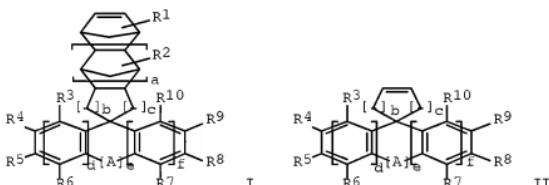
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006225316	A	20060831	JP 2005-40826	20050217
PRIORITY APPLN. INFO.:			JP 2005-40826	20050217

OTHER SOURCE(S): MARPAT 145:293498

ED Entered STN: 31 Aug 2006

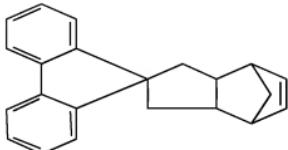
GI



AB The derivs. I [R1-R10 = H, halo, C1-10 hydrocarbylene, etc.; a-f = 0-2 (b = c ≠ 0); A = single bond, O, S, SO, etc.], useful for index anisotropy-controlling monomers for optical-grade transparent resins, are prepared by Diels-Alder reaction of cycloolefins II (R1-R10, a-f = the same as above) with cyclopentadienes (at 100-250°). Thus, 0.12 mol cis-1,4-dichloro-2-butene was reacted with 0.1 mol fluorene in DMSO in the presence of NaOH and Et3BzNCl at 95-100° to give a product mixture, which was further reacted with dicyclopentadiene at 210° and recrystd. from MeOH to afford spiro[fluorene-9,8'-tricyclo[4.3.0.12,5][3]decene] in 22% yield.

IT 908004-25-1P  
 (monomers; preparation of norbornene monomers by Diels-Alder reaction of

cycloolefins and cyclopentadienes for optical-grade resin  
 materials)  
 RN 908004-25-1 HCAPLUS  
 CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro- (CA INDEX NAME)



CC 35-2 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 73

IT 908004-25-1P  
 (monomers; preparation of norbornene monomers by Diels-Alder reaction of cycloolefins and cyclopentadienes for optical-grade resin materials)

L37 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2006:705949 HCAPLUS Full-text

DOCUMENT NUMBER: 145:155751

TITLE: Opticals films containing norbornene (co)polymers with positive wavelength dependency, manufacture of same films, and sheet polarizers comprising same films as protective films

INVENTOR(S): Miyaki, Nobuyuki; Miyamoto, Yoshikazu; Kawashima, Naoyuki; Yoshida, Shuichi; Kajiwara, Ichiro; Komiya, Zen

PATENT ASSIGNEE(S): Jsr Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 54 pp.  
 CODEN: JKXXAF

DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006188671	A	20060720	JP 2005-351865	20051206
PRIORITY APPLN. INFO.:			JP 2004-355532	A 20041208

ED Entered STN: 20 Jul 2006  
 GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB Claimed are the optical films made of norbornene (co)polymers having structural unit I [m, n = 0-2; X = CH:CH, CH<sub>2</sub>CH<sub>2</sub>; R1-8 = H, halo,

(substituted) C1-30 hydrocarbyl which may bear connecting group bearing (O, N, S, or Si), polar group; p, q, r = 0-2]. The optical films are manufactured by solvent casting or melt extrusion. The (co)polymers show stable pos. wavelength dependency in whole region at 400-800 nm regardless of changes of environmental temperature and moisture.

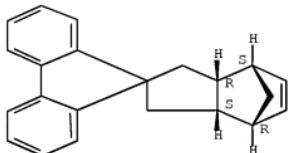
IT 791813-28-0P

(in preparation of norbornene monomers for metathetic ring-opening polymerization for manufacture of optical film)

RN 791813-28-0 HCPLUS

CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'S,7'R,7'aS)-rel- (CA INDEX NAME)

Relative stereochemistry.



IT 797785-12-7UP, hydrogenated

(metathetic ring-opening polymerized, optical film; manufacture of norbornene (co)polymer optical film, and sheet polarizer comprising same as protective film)

RN 797785-12-7 HCPLUS

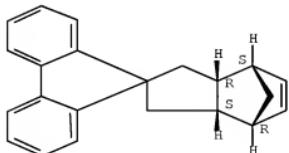
CN 1,4:5,8-Dimethanophthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-2-methyl-, methyl ester, polymer with rel-(3'aR,4'S,7'R,7'aS)-1',3',3'a,4',7',7'a-hexahydrospiro[9H-fluorene-9,2'-(4,7)methano[2H]indene] (9CI) (CA INDEX NAME)

CM 1

CRN 791813-28-0

CMF C22 H20

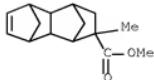
Relative stereochemistry.



CM 2

CRN 58732-15-3

CMF C15 H20 O2



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 25, 38  
 IT 791813-28-0P  
     (in preparation of norbornene monomers for metathetic ring-opening polymerization for manufacture of optical film)  
 IT 797785-12-7DP, hydrogenated  
     (metathetic ring-opening polymerized, optical film; manufacture of norbornene (co)polymer optical film, and sheet polarizer comprising same as protective film)

L37 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:1015980 HCAPLUS Full-text  
 DOCUMENT NUMBER: 142:7275  
 TITLE: Norbornene derivative, norbornene polymer produced by ring-opening (co)polymerization, and ring-opening (co)polymerization process  
 INVENTOR(S): Miyamoto, Yoshikazu; Miyaki, Nobuyuki; Goto, Kohei; Hashiguchi, Yuichi  
 PATENT ASSIGNEE(S): JSR Corporation, Japan  
 SOURCE: PCT Int. Appl., 83 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004101478	A1	20041125	WO 2004-JP6095	20040427
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP 2004323489	A	20041118	JP 2003-135702	20030514
EP 1623967	A1	20060208	EP 2004-729707	20040427
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK				
JP 2005036201	A	20050210	JP 2004-172229	20040610
US 20070065747	A1	20070322	US 2005-556717	20051114

PRIORITY APPLN. INFO.:

JP 2003-135702

A 20030514

JP 2003-185203

A 20030627

JP 2003-60061

A 20030306

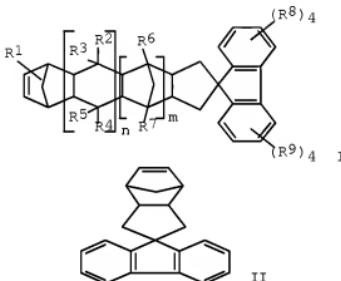
WO 2004-JP6095

W 20040427

OTHER SOURCE(S): MARPAT 142:7275

ED Entered STN: 25 Nov 2004

GI



**AB** Spironorbornene derivative I [R1-R9 = H, halo, polar group, (un)substituted C1-30 alkyl which may have linking groups bearing O, N, S or Si atoms; s, t, u = 0-3; m, n = 0-2] is prepared and used as a precursor monomer for producing cycloolefin polymers having excellent transparency and heat resistance, reduced water absorption, and high solubility in organic solvents. Thus, exo II was prepared and polymerized with 8-methoxycarbonyl-8-methyltetracyclo[4.4.0.12,5.17,10]-3-dodecene to give a copolymer, which was hydrogenated and made into a transparent film showing peculiar birefringence and wavelength dependence.

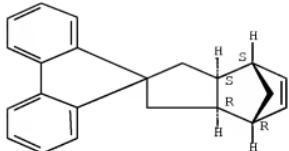
**IT** 791813-27-9P 791813-28-0P

(preparation and ring-opening polymerization of spiro norbornene derivs.)

**RN** 791813-27-9 HCPLUS

**CN** Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'R,7'S,7'aS)-rel- (CA INDEX NAME)

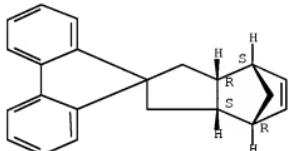
Relative stereochemistry.



RN 791813-28-0 HCPLUS

CN Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'S,7'R,7'aS)-rel- (CA INDEX NAME)

Relative stereochemistry.

IT 797785-11-6DP, hydrogenated 797785-12-7DP,  
hydrogenated(preparation of spironorbornene polymers with good transparency and  
solubility and peculiar birefringence and wavelength dependence)

RN 797785-11-6 HCPLUS

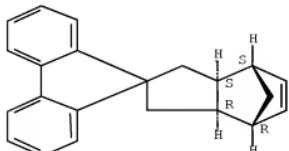
CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-2-methyl-, methyl ester, polymer with rel-(3'aR,4'R,7'S,7'aS)-1',3',3'a,4',7',7'a-hexahydrospiro[9H-fluorene-9,2'-(4,7)methano[2H]indene] (9CI) (CA INDEX NAME)

CM 1

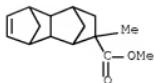
CRN 791813-27-9

CMF C22 H20

Relative stereochemistry.



CM 2

CRN 58732-15-3  
CMF C15 H20 O2

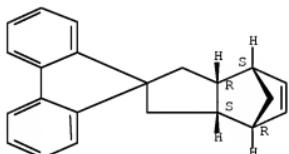
RN 797785-12-7 HCPLUS

CN 1,4:5,8-Dimethanonaphthalene-2-carboxylic acid, 1,2,3,4,4a,5,8,8a-octahydro-2-methyl-, methyl ester, polymer with rel-(3'aR,4'S,7'R,7'aS)-1',3',3'a,4',7',7'a-hexahydrospiro[9H-fluorene-9,2'-(4,7)methano[2H]indene] (9CI) (CA INDEX NAME)

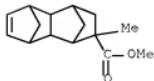
CM 1

CRN 791813-28-0  
CMF C22 H20

Relative stereochemistry.



CM 2

CRN 58732-15-3  
CMF C15 H20 O2

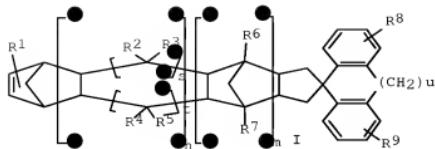
IC ICM C07C013-72

ICS C08G061-06  
 CC 37-3 (Plastics Manufacture and Processing)  
 Section cross-reference(s): 35  
 IT 791813-27-9P 791813-28-0P  
 (preparation and ring-opening polymerization of spiro norbornene derivs.)  
 IT 797785-11-6UP, hydrogenated 797785-12-7DP,  
 hydrogenated  
 (preparation of spironorbornene polymers with good transparency and  
 solubility and peculiar birefringence and wavelength dependence)  
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE  
 RE FORMAT

L37 ANSWER 14 OF 14 HCPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:993154 HCPLUS Full-text  
 DOCUMENT NUMBER: 141:411390  
 TITLE: Norbornenes having spiro structures for  
 cycloolefin polymers showing desired optical  
 properties  
 INVENTOR(S): Miyamoto, Yoshikazu; Miyaki, Nobuyuki; Hashiguchi,  
 Yuichi; Goto, Kohei  
 PATENT ASSIGNEE(S): JSR Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 29 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004323489	A	20041118	JP 2003-135702	20030514
WO 2004101478	A1	20041125	WO 2004-JP6095	20040427
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, RU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TG, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1623967	A1	20060208	EP 2004-729707	20040427
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK				
CN 1787983	A	20060614	CN 2004-80013152	20040427
US 20070065747	A1	20070322	US 2005-556717	20051114
PRIORITY APPLN. INFO.:			JP 2003-60061	A 20030306
			JP 2003-135702	A 20030514
			JP 2003-185203	A 20030627
			WO 2004-JP6095	W 20040427

ED Entered STN: 19 Nov 2004  
 GI



**AB** The norbornenes are I [R1-R9 = H, halo, (O-, N-, S-, or Si-containing linkage-containing) C1-30 hydrocarbyl, polar group; s, t, u = 0-3; m, n = 0-2]. Thus, 5-norbornene-2-exo-3-exo-dimethanol was treated with p-MeC<sub>6</sub>H<sub>4</sub>SO<sub>2</sub>Cl in the presence of pyridine and treated with fluorene in the presence of BuLi to give exo-I (R1-R9 = H, m = n = u = 0).

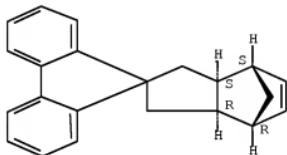
**IT** 791813-27-9P 791813-28-0P

(manufacture of norbornenes having spiro structures for cycloolefin polymers showing desired optical properties)

**RN** 791813-27-9 HCPLUS

**CN** Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'R,7'S,7'aS)-rel- (CA INDEX NAME)

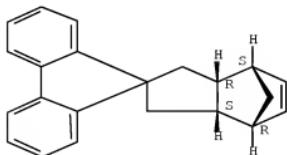
Relative stereochemistry.



**RN** 791813-28-0 HCPLUS

**CN** Spiro[9H-fluorene-9,2'-(4,7)methano[2H]indene], 1',3',3'a,4',7',7'a-hexahydro-, (3'aR,4'S,7'R,7'aS)-rel- (CA INDEX NAME)

Relative stereochemistry.



IC ICM C07C013-72  
ICS C08G061-08; G02B005-30; G02B006-00; G02B006-12; G02F001-1333;  
G02F001-1335; G02F001-1336  
CC 35-2 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 25  
IT 791813-27-9P 791813-28-0P  
(manufacture of norbornenes having spiro structures for cycloolefin  
polymers showing desired optical properties)

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(FILE 'HOME' ENTERED AT 13:13:14 ON 14 JUL 2008)

FILE 'HCAPLUS' ENTERED AT 13:13:25 ON 14 JUL 2008  
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       SEL RN

FILE 'REGISTRY' ENTERED AT 13:13:38 ON 14 JUL 2008  
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               699-97-8/B1 OR 791813-27-9/B1 OR 791813-28-0/B1 OR  
               86-73-7/B1 OR 699-95-6/B1 OR 797785-11-6/B1 OR 797785-12-7/  
               B1 OR 98-59-9/B1)  
 L3           STR  
 L4           0 SEA SSS SAM L3  
 L5           STR L3  
 L6           49 SEA SSS SAM L5  
 L7           STR L3  
 L8           5 SEA SSS SAM L7  
 L9           STR L7  
 L10          0 SEA SSS SAM L9  
 L11          3148 SEA SSS FUL L5  
             SAV L11 TEMP TRU717/A  
 L12          4 SEA ABB=ON PLU=ON L11 AND L2  
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 L14          15 SEA SUB=L11 SSS FUL L9  
             SAV L14 TEMP TRU717A/A

FILE 'HCAPLUS' ENTERED AT 13:29:32 ON 14 JUL 2008  
 L15          14 SEA ABB=ON PLU=ON L14

FILE 'CAOLD' ENTERED AT 13:29:46 ON 14 JUL 2008  
 L16          0 SEA ABB=ON PLU=ON L14

FILE 'BEILSTEIN' ENTERED AT 13:29:55 ON 14 JUL 2008  
 L17          0 SEA ABB=ON PLU=ON L14  
 L18          0 SEA ABB=ON PLU=ON L14

FILE 'MARPAT' ENTERED AT 13:30:09 ON 14 JUL 2008  
 L19          0 SEA SSS SAM L9  
 L20          2 SEA SSS FUL L9

FILE 'REGISTRY' ENTERED AT 13:53:24 ON 14 JUL 2008  
 L21          STR L3  
             DIS SIA  
 L22          50 SEA SUB=L11 SSS SAM L21  
 L23          2 SEA SUB=L11 SSS SAM L3  
 L24          54 SEA SUB=L11 SSS FUL L3  
 L25          11 SEA ABB=ON PLU=ON L24 AND PMS/CI  
 L26          46 SEA ABB=ON PLU=ON L24 NOT FULLER?  
 L27          35 SEA ABB=ON PLU=ON L26 NOT FLUORANTHENE?  
 L28          34 SEA ABB=ON PLU=ON L27 NOT 1-100/SI  
 L29          30 SEA ABB=ON PLU=ON L28 NOT DISPIRO?  
 L30          28 SEA ABB=ON PLU=ON L29 NOT FURAN?  
 L31          4 SEA ABB=ON PLU=ON L30 NOT FLUORENE?  
 L32          29 SEA ABB=ON PLU=ON L29 NOT MORPHOLINYL?  
 L33          28 SEA ABB=ON PLU=ON L32 NOT MORPHOLINE?  
 L34          15 SEA ABB=ON PLU=ON L33 AND L14

10/556,717

L35 13 SEA ABB=ON PLU=ON L33 NOT L34

FILE 'HCAPLUS' ENTERED AT 14:12:08 ON 14 JUL 2008  
L36 14 SEA ABB=ON PLU=ON L34  
L37 14 SEA ABB=ON PLU=ON L15 OR L36

FILE 'MARPAT' ENTERED AT 14:12:30 ON 14 JUL 2008  
L38 0 SEA ABB=ON PLU=ON L20 NOT L37